Reading

Reading in KLM is primary, and my course notes are secondary. Reading my course notes will likely be helpful in filling in some background, and I will draw some exercises from the notes (KLM seems to have a dearth of exercises).

- KLM, rest of Chapters 2 and 3. If you want to see an alternate proof of the Spectral Theorem (KLM Theorems 2.4.2 and 2.4.3) from the one I gave in class, look at the Background Material supplied with my course notes (http://www.cse.sc.edu/~fenner/csce790/notes/background.pdf).

- KLM, Chapter 3, Sections 3.1 and 3.2

- Course notes, Lectures 4, 5, 6, 7

Written Exercises

1. Let $A \in \mathcal{L}(\mathcal{H})$ and $B \in \mathcal{L}(\mathcal{H})$ be positive operators on a Hilbert space $\mathcal{H}$. Show that if $\sqrt{A}\sqrt{B} = 0$, then $AB = 0$. (This is the missing step in the proof of the result I gave on 2/10/2020 that if $\langle A, B \rangle = 0$ then $AB = 0$.)

2. Do Course Notes Exercises 5.3, 5.4, 5.6, 5.7, 5.8, 5.9, 5.11, 5.12, 7.2, 7.3.
Note: Here are some more notational discrepancies between my lecture/notes and the book:

1. If $E$ is some expression representing a matrix, then I use $[E]_{ij}$ to denote the $(i, j)$th entry of $E$. This is useful particularly when $E$ is an expression of any complexity, because it does not require coming up with a new letter to represent the matrix.

2. I’ve seen KLM use the same symbol for a ket label and for a coefficient in the same expression, e.g., $\sum_{i=1}^{n} T_i |T_i\rangle$. This is not ambiguous, because the Dirac notation makes it clear what purpose each occurrence is for. However, to avoid confusion, I will keep ket labels distinct from coefficients to the extent possible.